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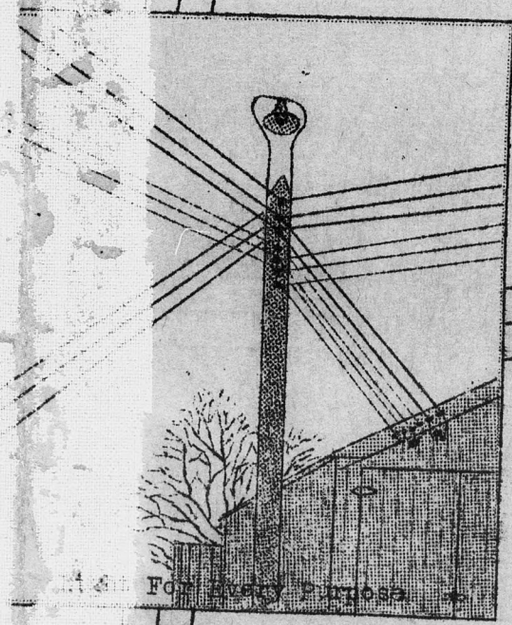
RECOMMENDED FARM LIGHTING PRACTICES



by

Albert V. Krewatch

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RECOMMENDED FARM LIGHTING PRACTICES

by
Albert V. Krewatch
Specialist in Agricultural Engineering

General Principles

In the past the chief advantages of electric lighting were thought to be convenience, cleanliness, and safety. Today, however, the Science of Seeing has proved those things to be of secondary importance. It is now known that lighting definitely affects human efficiency, resources and behavior. It has been proved that seeing uses up a tremendous amount of nervous energy and even affects the rate of heart beat. Prolonged visual work under poor lighting may be as tiring physically as a day's hard physical labor. Many cases of headache and indigestion are caused by eye-strain due to inadequate or improper lighting.

Since the farmer spends the majority of his time out-of-doors his need for good artificial lighting is somewhat less than that of workers of more confining occupations. However, after a hard day's work, it is a real pleasure to relax in a living room with plenty of light. The farmer's wife and children spend most of their time indoors and at severe visual tasks.

Lighting intensities recommended by the Illuminating Engineering Society for some of the tasks they have to perform are as follows:

1.	General - kitchen and moderate tasks	10 - 20 footcandles*
2.	Ordinary reading	10 - 20 footcandles
3.	Studying - average sewing	20 - 50 footcandles
4.	Sewing - fine work	50 - 100 footcandles

Safe seeing is not dependent upon quantity of light alone. It is a matter of quality of light as well as freedom from glare and the control of shadows and absence of sharp contrast between lighted objects and their background.

All bare lamps should be shaded. Portable lamps should be so placed that no exposed bulbs are visible beneath the shades, and placed to one side rather than directly in front or in back of the user so that there will be no reflected glare from shiny paper or mirrored surfaces.

The general level of lighting in a room should be at least one-tenth of that on the working area, i.e., if 20 footcandles are used on the book, there should be not less than 2 footcandles at any other part of the room in the line of vision of the reader.

There are now available both floor and table type lamps that are constructed according to mordern scientific principles of design and assure good lighting. Such lamps are known as "Better Sight" lamps and carry the Illuminating Engineering Society Certification Tag. Lamps of this sort deliver about 50 footcandles fairly close to the lamp, and 10 to 15 footcandles

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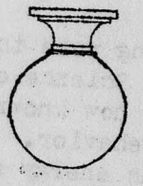
* A footcandle is the unit of measure of light. One footcandle is the amount of light that would fall on an object placed one foot away from an ordinary tallow candle. There are approximately 60 footcandles of light at a distance of one foot from a 40-watt Mazda lamp, at 2 feet there are only 15 footcandles and at 3 feet, 6 footcandles.

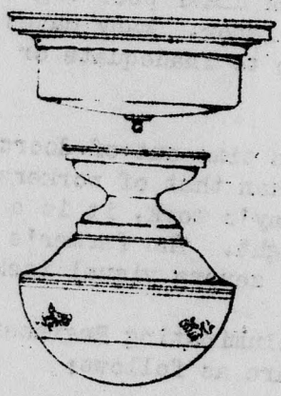
three feet away. They also direct considerable light upwards for general diffusion throughout the room.

The Porch



Light is needed for safety and convenience on both front and back porches. Use a 40 or 60 watt lamp in a totally enclosed globe, so located as to light all of the steps.

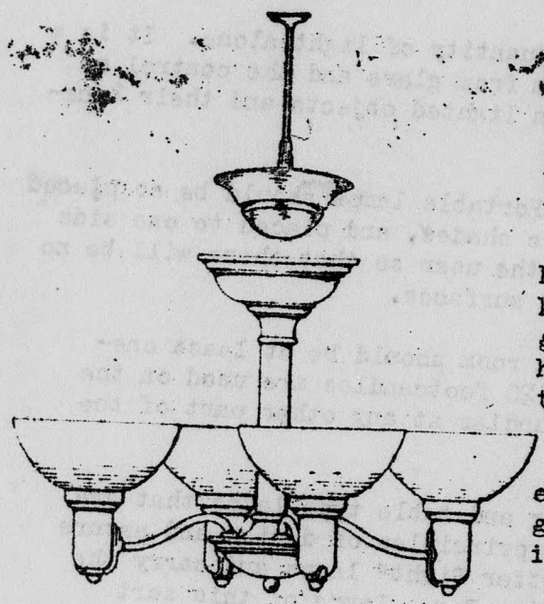
The Halls



For high ceilings use a 100 watt lamp in lantern or pendant-type fixtures. With a low ceiling use a close-to-the-ceiling type fixture. Choose good diffusing glassware.

In an upper hall use a 60 or 75 watt lamp in a single enclosing globe. Lamps should be so located as to light the full length of the stairs.

The Living Room

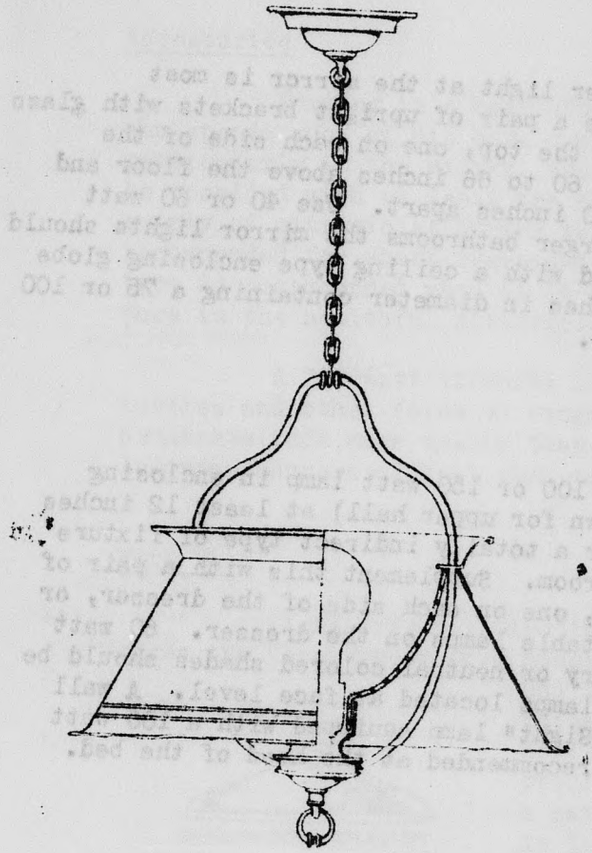


Probably in this room the farm family performs the most severe and prolonged visual tasks. Use a "Better Sight" portable lamp at each place where any member of the family may sit. Such lamps should use at least 100 watt bulbs if equipped with a single socket and 60 watt bulbs if equipped with 2 or 3 sockets.

Very attractive lamps having holders for plants are available. These are known as Plantlights. They not only provide good lighting, but enable the growing of house plants at locations well removed from the windows.

A good central ceiling fixture equipped with well shaded bulbs to provide general illumination throughout the room is important. Two different types are shown.

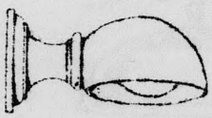
If the room is of average size and has light colored walls and ceiling, a total of 700 and 800 watts will be necessary to light it well. If walls and ceiling are fairly dark, these wattages should be increased 15 to 25 per cent.



The Dining Room

In many farm homes the dining room is used almost as a second living room, and is often a favorite place for the children to do their studying and card playing, and for the father to read the evening newspaper after supper. The new "Better-Sight" dining room fixture is probably the most practical recommendation for this dual-purpose room because it hangs low over the table and incorporates the features of the larger "Better-Sight" three-light floor lamp. Its large glass bowl insures a soft, downward light for the table, and its indirect light adds restfulness to the room. This type of fixture is flexible and economical because during the meal the 100 watt filament will provide sufficient light, and afterward when the table is cleared for play or studying, the 200 or 300 watts will provide from 15 to 25 footcandles over the entire surface of the table.

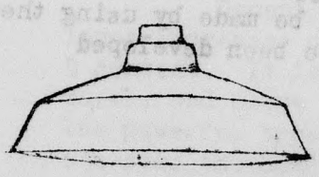
The Kitchen



The Woman's workshop. Good lighting is necessary for preparation of food, washing dishes, and general tasks. For moderate sized kitchens use one diffusing glass enclosed unit (at least 10 inches in diameter) with a 100 or 150 watt lamp in the center of the ceiling.

Provision should also be made for additional individual local light over work spaces, particularly, the range and the sink. Glass-shaded brackets with 60 watt lamps are recommended for this use. In homes not wired for these brackets, small portable wall lamps connected to convenience outlets may be used.

The Laundry

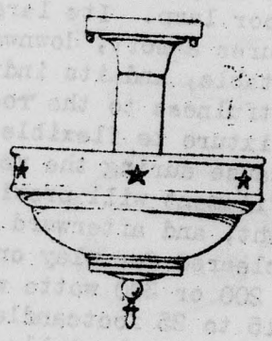


Daylight lamps are particularly desirable here. Use one or two 150 watt daylight lamps in enclosing globes, depending upon the size of the room. If ceilings are dark and unfinished RLM porcelain enameled dome type reflectors should be used.

Bathrooms

Proper light at the mirror is most essential. Use a pair of upright brackets with glass shades open at the top, one on each side of the mirror mounted 60 to 66 inches above the floor and spaced about 30 inches apart. Use 40 or 60 watt lamps. For larger bathrooms the mirror lights should be supplemented with a ceiling type enclosing globe at least 9 inches in diameter containing a 75 or 100 watt lamp bulb.

Bedrooms



Use 100 or 150 watt lamp in enclosing globe (as shown for upper hall) at least 12 inches in diameter or a totally indirect type of fixture in center of room. Supplement this with a pair of wall brackets, one on each side of the dresser, or a pair of portable lamps on the dresser. 60 watt lamps and ivory or neutral colored shades should be used and the lamps located at face level. A wall type "Better-Sight" lamp equipped with a 100 watt lamp bulb is recommended at the head of the bed.

Closets

Use a 60 watt lamp and pull chain socket conveniently located just inside the door. For convenience fasten one end of a linen cord to the pull chain and the other at a convenient point on the inside of the closet near the door.

The Cellar

Light for safety is particularly desirable here. Use a shaded 60 watt lamp so located as to light the cellar stairs and controlled by a switch at the head of the stairs. (A 40 watt lamp is desirable in front of the furnace and in the fruit closet or other storage spaces in the cellar.)

Renovating Existing Fixtures

For houses already equipped with older types of fixtures, considerable improvement in the lighting can often be made by using the new types of parchment fixture equipment which have been developed recently.

Accessories

Farming is a healthful occupation, particularly for the farmer who spends much of his time out-of-doors. His wife and children, however, particularly in the winter, spend most of their time indoors. They may be provided with at least one ultraviolet lamp to give them an adequate supply of ultraviolet during the winter. The powerful type is recommended for short treatments of 5 to 10 minutes. The less powerful type is recommended when it is desirable to read or sew for an hour or more in the healthful ultraviolet radiation.

A 250 watt infrared lamp is recommended for the relief of sore muscles and other forms of congestion. The radiation from this lamp will penetrate much more deeply than that from carbon filament lamps and non-luminous sources of heat such as hot water bottles or electric heating pads.

Farm Yard

Light offers protection against accidents and prowlers and makes the farm appear more hospitable to visting friends or customers. Use 100 or 150 watt lamps with shallow dome reflectors mounted at least 15 feet high. Reflectors and holders should be of weather proof variety. Lamps should be controlled by a switch in the house, or three-way switches in the house and barn so that the light may be turned on or off from either place.

SHALLOW DOME REFLECTOR

Floodlighting may be installed for protective purpose in gardens, vineyards, around poultry houses, and storage houses. Use 100 watt or 200 watt floodlights mounted on poles or buildings and controlled by the same switch that controls the yard lights. (See cover page picture)

Dairy Barn

Ample light causes cows to eat and drink more and hence produce more milk. Light facilitates work in the barn, promotes cleanliness, and thus tends to reduce milk contamination. Use 100 watt lamps equipped with RLM porcelain enameled reflectors and spaced 15 to 20 feet apart over each feeding alley and each cleaning alley. Stagger those in the feeding alley with those in the cleaning alley. Pull switches may be used on individual lamps if desired.

RLM STANDARD DOME REFLECTOR

Recent research indicates that the use of ultraviolet or sun-lamps increases milk production, reduces bacteria, and improves Vitamin D content. It is claimed to help control lice on cattle, helps to cure sores, and keeps the cattle in better health through out the winter. Use the powerful type Sunlamps or 500 watt ultraviolet lamps on the ceiling, one over the head of every third cow in a single row, or over the center of the aisle where there is a double row of cattle facing each other. Burn the powerful type ultraviolet lamps 1 to 2 hours per day, or the 500 watt ultraviolet lamps 6 to 8 hours per day.

Milk House

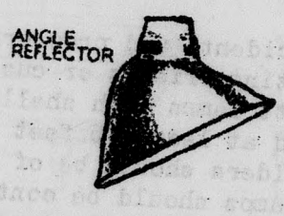
Lighting is particularly desirable here to promote cleanliness. Use 60 or 75 watt lamp with porcelain enameled reflector mounted on ceiling in center of room. Another lamp is desirable over sink or washing rack.

Bottling Room

Good light speeds up the work. Use 100 watt lamps and RLM reflectors on ceiling spaced 10 feet apart each way.

Hay Barn Loft

The chief requirement here is ability to move about in safety and comfort. Use 100 watt lamps in dome or angle type reflectors mounted high on central posts or tie beams. Two units directed to each side are required for good lighting in large barns. The very remote possibility of fire may be eliminated by the use of dust-tight enclosing globes. Locate switches at the most used entrances.



Small Granary or Feed Room

Moderate illumination is required for handling feed and to minimize danger of falling. Use a 25 watt lamp on the ceiling or wall, and locate switch close to entrance door. In large grain rooms where there is considerable dust, dust-tight enclosing globes may be used to eliminate the very remote possibility of fire.

Horse Barn

Light is required for cleaning, for convenience in getting about, harnessing, feeding, etc. With stalls on both sides of a central aisle use 60 watt or 100 watt lamps and porcelain enameled reflectors mounted on ceiling of center passageway. Locate one lamp on partition line between every other pair of opposite stalls. Supplement with a 15 watt lamp out of reach of the horse's head on wall or joist between each two stalls. These lamps should be on individual switches or pull chain sockets. For box stalls use one 40 or 50 watt lamp in RLM shallow dome reflector on center of ceiling with switch located outside stall door.

Silo and Chute

Light is needed for safety and convenience. Use 60 or 100 watt lamp in RLM reflector near top of silo or over chute, or in space between silo and barn, so located as to direct some light into silo through open doors.

Beef Cattle Barn

Light is needed principally for feeding. Use 50 or 60 watt lamps in RLM reflectors on ceiling over center of feeding alleys. Space lamps 20 to 30 feet apart.

Sheep Barn

Lighting requirements and specifications similar to those for beef cattle barn. In shepherd's room use 100 watt lamp and RLM reflector on ceiling.

Hog House

Light is essential primarily for feeding. Use 60 watt lamps and RLM reflectors mounted as high as practical along center of ceiling and spaced 10 to 20 feet apart. A yard light is useful over the outdoor feeding trough.

Farm Shop and Machine Shed

Good lighting is essential to enable repair work or other work to be done at night. Light should be free from heavy shadows. This necessitates use of more than one lamp. Use 100 watt lamps and RLM reflectors mounted 10 feet above floor and spaced 10 feet apart each way. It is desirable to hang units over the work bench. An extension cord with 50 watt Rough Service lamp in reflector equipped with wire guard is a great convenience in the shop. Heavy rubber cord should be used for this purpose -- not ordinary lamp cord.

Garage

Light is used primarily for working on cars. Use a 60 or 100 watt lamp with RLM reflector over the hood of each car. Here also a portable or extension cord lamp similar to one recommeded for the farm shop is a convenience. Three-way switches are recommended so that garage lights may be turned on or off from the house or in the garage.

Poultry House

Here most of the light should fall on the feed hoppers and water troughs to enable the birds to continue active for several hours after dark or prior to day-light. A small amount of light should fall on the roosts. Use 40 or 60 watt lamps equipped with RLM reflectors, hung 6 feet above the floor and spaced 10 feet apart. Lamps should be located on a line midway between the front of the house and the front of the dropping boards. With night lighting, dimmers are sometimes used to gradually reduce the light, simulating twilight, to encourage the birds to get on the perch before complete darkness. This may also be accomplished by turning off the main lighting and turning on 10 watt lamps located about 20 feet apart on the ceiling.

Provision should be made for the use of ultraviolet or sunlamps. Either the powerful type lamps or 250 watt lamps equipped with RLM Aluminum type reflectors are used. (Porcelain enameled reflectors are unsuitable for use with sunlamps as they reflect very little ultraviolet.) The ultraviolet lamps should be mounted over the feed hoppers, the powerful type lamp 5 feet above the hopper, and the 250 watt lamp 3 feet above the hopper. The powerful type should be used one-half to one hour per day, and the 250 watt lamp 5 to 6 hours. One lamp should be used for each 100 birds.

Automatic time clocks are a great advantage for controlling both the regular lighting and the sunlamps.

Switches

Considerable time and many steps may be saved by a liberal use of three-way switches. These enable turning on a lamp from one location and turning it off from another. For example, lighting the yard or barn lights from the barn and turning them off from the house, or vice versa. Similarly the control of hall lights from either the top or the foot of the stairs saves time and effort.

It is well worth while to study each room from the point of view of its most used entrances and exits, and locate the switches where they will be most convenient.

Wiring

It is very essential to see that wiring of adequate size is used in all cases. Too small wires result in loss of voltage that materially reduces the light output of lamps and increases the cost of lighting.

It is desirable to have the convenience outlets on separate circuits from the overhead lighting, as blowing a fuse on the former circuit may not then leave the room in darkness.

Care must be used to ~~divide~~ the load into several circuits so as not to overload any one circuit.

Additional Information

"How to Plan Your Electric Wiring", Rural Electrification Series, No. 4, is available. This circular gives detailed information on how to economically lay out an adequate, convenient and safe wiring system for the entire farm.

"Furnishing the Home for Better Living" by Miss Florence H. Mason, Home Furnishings Specialist, gives suggestions for the desirable arrangement of lamps and fixtures in order to make your home lighting both comfortable and decorative.

This information can be obtained from the office of your County Agent or your Home Demonstration Agent, or you may write to the Extension Service, University of Maryland, College Park, Maryland.

Rural Electrification Series, No. 6

May, 1949

THE SAFE USE OF ELECTRICITY IN MARYLAND HOMES

ELECTRICAL TERMS

by

Albert V. Krewatch

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COLLEGE PARK, MD

Cooperative Extension Work in Agriculture and Home Economics,
Extension Service, University of Maryland, and
United States Department of Agriculture, Cooperating,

T. B. SYMONS, Director

(Distributed in Furtherance of Acts of Congress)
of May 8 and June 30, 1914)

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